NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD

WATERING FACILITY

(No.)

CODE 614

DEFINITION

A permanent or portable device to provide an adequate amount and quality of drinking water for livestock and/or wildlife.

PURPOSE

To provide access to drinking water for livestock and/or wildlife in order to:

- Meet daily water requirements
- Improve animal distribution

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to all land uses where there is a need for new or improved watering facilities for livestock and/or wildlife.

CRITERIA

General Criteria Applicable To All Purposes

Design watering facilities with adequate capacity and supply to meet the daily water requirements of the livestock and/or wildlife planned to use the facility. Include the storage volume necessary to provide water between periods of replenishment. Refer to the National Range and Pasture Handbook for guidance on livestock water quantity/quality requirements. For wildlife, base water quantity and quality requirements on targeted species needs. See Table 1 for expected and/or anticipated consumptive rates of wildlife.

Locate facilities to promote even grazing distribution and reduce grazing pressure on sensitive areas.

Design the watering facility to provide adequate access to the animals planned to use the facility. Incorporate escape features (ramps, etc.) into the watering facility design where local knowledge and experience indicate that wildlife may be at risk of drowning.

Include design elements to meet the specific needs of the animals that are planned to use the watering facility, both livestock and wildlife. See Table 2 and 3 for tank and apron sizes.

Protect areas around watering facilities where animal concentrations or overflow from the watering facility will cause resource concerns. Use criteria in Heavy Use Area Protection (561) to design the protection.

Install permanent watering facilities on a firm, level foundation that will not settle differentially. Examples of suitable foundation materials are bedrock, compacted gravel and stable, well compacted soils.

Design and install watering facilities to prevent overturning by wind and animals.

Design watering facilities and all valves and controls to withstand or be protected from damage by livestock, wildlife, freezing and ice damage.

Construct watering facilities from durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. Follow appropriate NRCS design procedures for the material being used or industry standards where NRCS standards do not exist.

Use the criteria in Pipeline (516) to design piping associated

with the watering facility. Include backflow prevention devices on facilities connected to wells, domestic or municipal water systems.

CRITERIA – WILDLIFE

Because each facility is unique to species, habitat, topography and climate, watering facilities must be planned and installed according to a plan and adapted to the specific site. Types of facilities include:

1. Rain Traps – impervious catchments with storage tank and drinking facilities.
2. Duguouts and pits supplied by surface runoff, stream diversion or spring flow.
3. Drinking troughs supplied from a pipeline.

Methods used will be designed to protect the soil resource from erosion.

The distribution and spacing of facilities shall be based on topography, required travel distance to water and the home range, territory size and distribution of the target species. See Table 4 (Distance between available water).

Management measures shall be provided to control invasive species and noxious weeds.

Disturbed areas shall be vegetated according to a revegetation plan using adapted plant materials.

TABLE 1
Water Requirements

Facilities will be designed to supply the following water requirements:

Mule deer	1-2 gallons/animal/day
Antelope	1-2 gallons/animal/day
Elk	5-8 gallons/animal/day
Rocky Mountain goat	1-2 gallons/animal/day
Rocky Mountain Bighorn sheep	1-2 gallons/animal/day
Quail	750 gallons/covey/year
Chukar	750 gallons/covey/year
Wild turkey	500 gallons/flock/on summer range
Sage grouse	500 gallons/flock/on summer range
Sharptail grouse	500 gallons/flock/on summer range
Hungarian partridge	500 gallons/flock/on summer range
Mourning dove	2-5 gallons/flock/day available year long
Pheasant	2-5 gallons/flock/day available year long
Songbirds	1-2 gallons/flock/day available year long

TABLE 2
Tank Size

The water storage capacity is determined by the average rainfall as follows for Minimum Tank Storage*:

Average Rainfall	**Capacity Required**
5” to 10”	750 gallons
10” or more	500 gallons

* The size can be reduced if used for small mammals and/or birds.

TABLE 3
Water Collection Apron

The water collecting apron size is determined by the minimum annual rainfall on record for the area and the tank storage capacity.

Circular Apron

Minimum Annual Rainfall (Inches)	Apron Radius (Ft) by Storage Size	
	500 gallons	750 gallons
6	--	14.0
8	--	12.0
10	7.0	11.0
12	7.0	10.0
14	7.0	9.0
16	7.0	8.5

Rectangular Apron

Minimum Annual Rainfall (Inches)	Apron Area by Storage Size	
	500 gallons (Sq. Feet)	750 gallons (Sq. Feet)
6	--	496
8	--	296
10	158	237
12	132	198
14	113	169
16	99	148

Watering facilities will be planned for a primary wildlife species.

TABLE 4 Distance Between Available Water		
Species	Optimum (Miles)	Maximum (Miles)
Mule deer	1	3
Antelope	2	3
Elk	1	3
Rocky Mountain goat	1	1
Rocky Mountain Bighorn sheep	1	2
Quail	0.5	1
Sage grouse	1	2
Sharptail grouse	1	2
Hungarian partridge	1	2
Chukar	0.5	1
Wild turkey	1	2
Mourning dove	3	5
Pheasant	0.5	1
Songbirds	0.25	0.5

CONSIDERATIONS

Design fences associated with the watering facilities to allow safe access and exit for area wildlife species. To protect bats and other species that access water by skimming across the surface, fencing material should not extend across the water surface. If fencing across the water is necessary, it should be made highly visible by avoiding the use of single wire fences, and using fencing materials such as woven wire or by adding streamers or coverings on the fence.

Consider the effects on downstream flows or groundwater that could affect other water users or associated aquatic sites.

Consider the effects on wetlands and other aquatic sites.

For watering facilities that will be accessible to wildlife, give consideration to the effects the location of the facility will have on target and non-target species. Also consider the effect of introducing a new water source within the ecosystem in the vicinity of the facility. This should include things such as the concentration of grazing, predation, entrapment, drowning, disease transmission, hunting and expansion of the wildlife populations beyond the carrying capacity of available habitat.

Consider the following guidelines for materials commonly used for watering facilities.

Concrete	3000 psi compressive strength
Galvanized Steel	20 gauge thickness
Plastic	Ultraviolet resistance
Fiberglass	Ultraviolet resistance

Where water is supplied continuously or under pressure to the watering facility, consider the use of automatic water level controls to control the flow of water to the facility and to prevent unnecessary overflows.

Watering facilities often collect debris and algae and should be cleaned on a regular basis. Consider increasing the pipe sizes for inlets and outlets to reduce the chances of clogging. Maintenance of a watering facility can be made easier by providing a method to completely drain the watering facility.

Steep slopes leading to watering facilities can cause erosion problems from overuse by animals as well as problems with piping and valves from excess pressure. Choose the location of watering facilities to minimize these problems from steep topography.

Consider the use of animal-activated devices to supply water, such as nose valves.

PLANS AND SPECIFICATIONS

Plans and specifications for watering facilities shall provide the information necessary to install the facility. As a minimum, this shall include the following:

- A map or aerial photograph showing the location of the facility, including section, township and range
- A drawing showing topographical contours
- A location of some form of surveying control (northing, easting, elevation), either local or State grid coordinates

- Detail drawings showing the enhancement, necessary appurtenances (such as foundations, pipes and valves) and stabilization of any areas disturbed by the installation of the watering facility
- Construction specifications describing the installation of the facility
- NRCS Biology Technical Note 23 or other recognized sources, such as designs by the Idaho Department of Fish and Game, US Forest Service, Bureau of Land Management and US Fish and Wildlife Service can be used to design a watering facility for a specific situation. **NOTE:** Outside agency designs must meet the Watering Facility standard for NRCS.

OPERATION AND MAINTENANCE

Provide an Operation and Maintenance (O&M) plan specific to the type of watering facility to the landowner. As a minimum, include the following items in the plan:

- a monitoring schedule to ensure maintenance of adequate inflow and outflow
- checking for leaks and repair as necessary
- if present, the checking of the automatic water level device to insure proper operation
- checking to ensure that adjacent areas are protected against erosion
- if present, checking to ensure the outlet pipe is freely operating and not causing erosion problems
- a schedule for periodic cleaning of the facility

REFERENCES

Brigham, William and Craig Stevenson, 1997. Wildlife Water Catchment Construction in Nevada, Technical Note 397.

Tsukamoto, George and San Juan Stiver, 1990. Wildlife water Development, Proceedings of the Wildlife Water Development Symposium, Las Vegas, NV. USDI Bureau of Land Management.

Yoakum, J. and W.P. Dasmann. 1971. Habitat manipulation practices. Ch. 14 in Wildlife Management Techniques, Third Edition. Ed. Robert H. Giles, Jr. Pub. The Wildlife Society. 633 pp.

National Engineering Handbook, Part 650, Engineering Field Handbook, Chapters 5, 11 & 12. USDA-Natural Resources Conservation Service.

National Range and Pasture Handbook, Chapter 6, pp. 6-12, Table 6-7 & 6-8. USDA-Natural Resources Conservation Service.

National Research Council, 1996. Nutrient Requirements of Domestic Animals. National Academy Press.

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